Software Assurance Forum

MITRE, McLean, Virginia

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DASD(C3ISR & IT ACQUISITION)

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Outline

- *Background*
- The Challenge
- New process
- Summary

Objectives

- Demonstrate Information Technology is dynamic and modular in nature and has grown apart from the production based deliberate acquisition process

- Highlight the need for change to our process for acquiring information technology

- Inspire new thinking in areas of acquisition of information technology, and the rapid delivery of relevant solutions to the warfighter

The focus of this brief is on new thinking in the area of acquisition

Definitions[1]

Net-Centricity – the capability to discover, access, trust, and use information

Interoperability – the ability of systems, units, or forces to provide and accept data, information, materiel, and services

Cyberspace – A global domain within the information environment consisting of the interdependent network of information technology infrastructures

Enterprise – Federal information structure needed to support modern warfare

Today's Information World is Dynamic, Integral to Operations, & larger than DoD

1. Source -DSB task force on achieving interoperability in a net-centric environment, March 2009

*Information Technology (IT)**

<u>Information Technology</u>: Any equipment or interconnected system …of equipment that is used in automatic :

- acquisition
- storage
- manipulation
- management
- movement
- control
- switching
- interchange
- transmission
- reception

of data or information by the executive agency

Data Collectors, Processors & Distributors

* Title 40 USC (formerly known as the Clinger Cohen Act of 1996)

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Expectations

Today's leaders & soldiers are digital natives and use IT technologies to their advantage for situational awareness and collaborative, agile decision making

The Environment:*

- Lack of information and services that are visible, accessible and understandable
- Information "silos"-- capability needed to move information from one stove-pipe to another
- Hard-wire interfaces aimed at predetermined needs unresponsive to dynamic environment
- Continue to not leverage the latest information technology solutions available commercially

"Digital Natives" trapped in industrial-era institution

*** Source: DSB Summer Study 2006**

Speed of War

- Digital Natives populate both sides of the battlefield
- Our enemy has an innate understanding of information technology
- Information technology is inherently flexible
- Information technology is ubiquitous

The Speed of War is driven by our adversaries

Speed of Competition

- i-phone was developed and fielded in less time than it would take DoD to budget for an IT program
- Over 90,000 applications have been fielded since the i-phone was released
- Other competitors are following
- This speed to market is powered by competition and enabled by the nature of IT

The speed of competition provides opportunity

Speed of "Process"

- The PPBE process enables resource control by the Congress, OSD, Joint Staff, and the Services.
  - Reprogramming six months
  - New funding 2-5 year lead-time
- Requirements Process supports PPBE pace
  - JCIDS review 6 months
  - Although IT box now adds flexibility
- Acquisition process aligned with both
  - Weapons systems delivered in decades
  - Six months to MDD
  - At least six months to next milestone

Combined "process" time is over ten years

The Challenge

Change our processes to take advantage of the speed of competition to address the speed of war and meet the expectations of the digital warriors.

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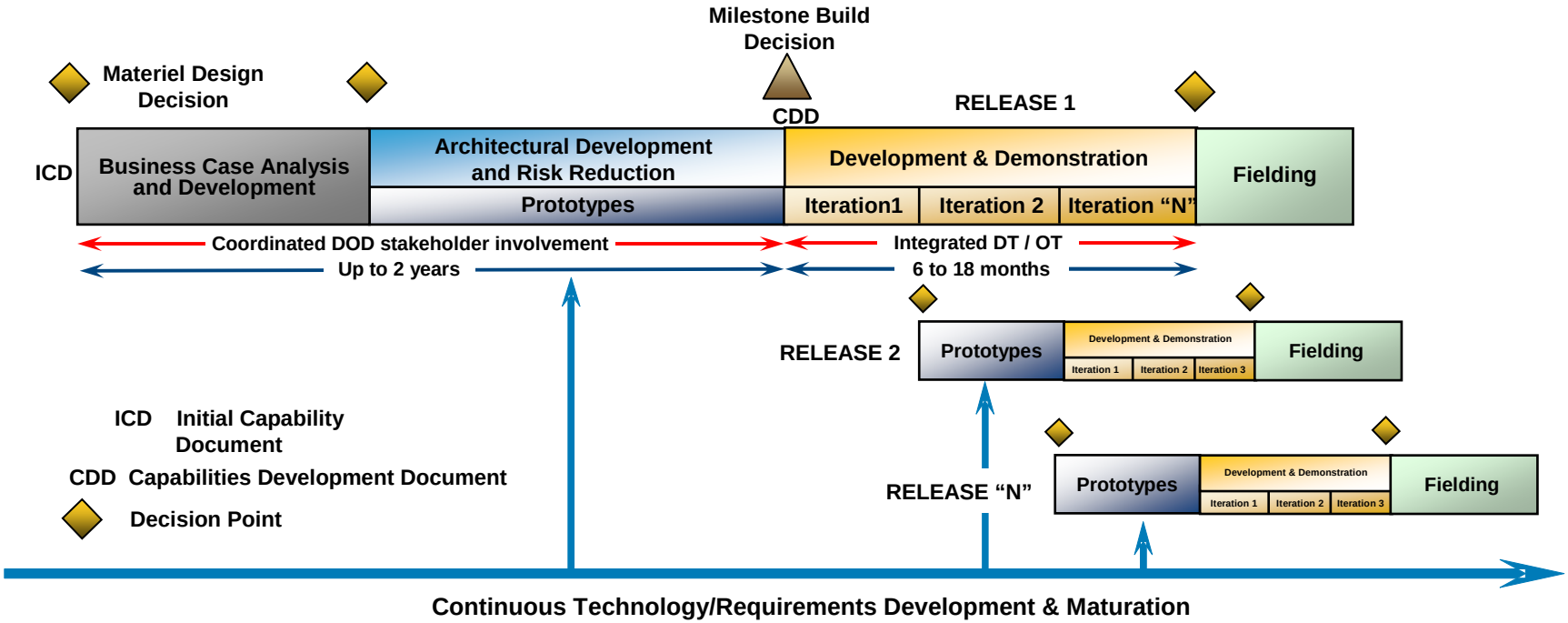
Approach

- Literature review, analysis and concept development
- Pilot process via tailoring DoD 5000
- Meet with Combatant Commands, Services, OSD stakeholders and program managers
- Establish Industry Advisory Group composed of traditional and nontraditional providers
- Collaborate with stakeholders to tailor existing processes/artifacts and update Defense Science Board acquisition process as necessary

DSB IT Acquisition Model



ICD established by streamlined JCIDS process
CDD and acquisition baseline for "N" releases established at milestone build decision
All releases fully funded at milestone build decision
Release "N+1" restarts entire process

Adapts an evolutionary approach to IT Acquisition

Literature Review – Bibliography

Achieving Effective Acquisition of Information Technology in the Department of Defense; National Research Council of the National Academies; December 2009

Acquisition Strategies for dealing with Uncertainty; Mitre Public Release 09-1310; Renee G. Stevens. Margaret K. King, Marc R. Halley; 2009

Agile Services in an (SO)Architected World; Agile Journal

Cloud Computing and Service Oriented Architecture Comparing Contemporary Enterprise-wide Information Technology Approaches; Mitre Technical report MTR090026; Geoffrey Raines; Jan 2009

Creating and Assured Joint DoD and Interagency Interoperable Net-Centric Enterprise; Defense Science Board; March 2009

Defense Acquisition Performance Assessment Report; Lieutenant General Ronald Kadish, USAF (Ret), et.al.; Jan 2006

Department of Defense Policies and Procedures for the Acquisition of Information Technology; Defense Science Board; March 2009

Fulfillment of Urgent Operational Needs; Defense Science Board; July 2009

Getting to Best: Reforming the Defense Acquisition Enterprise, A Business Imperative for change from the Task Force on Defense Acquisition law and Oversight; Business executives for National Security; July 2009

Industry Recommendations for DoD Acquisition of Information Services and SOA Systems ; SOA Acquisition Working Group; The Association for Enterprise Integration ;An Affiliate of the National Defense Industrial Association ; July, 2008

Mitre's perspective on emerging industry service-oriented architecture best practices ; Mitre Technical Report MTR080088; Salim Semy, Larry Pizette;Jan 2009

Navy Acquisition of Information Systems(draft); Bruce Wald; 9 October, 2009

Organizing for a Complex World, Developing Tomorrow's Defense and Net-Centric Systems; Center for Strategic & International Studies, Ben-Ari and Pierre A. Chao; foreward by David J. Berteau;Washington, D.C. 20006, 31-1; 2009

The Major Causes of Cost Growth in Defense Acquisition; IDA Paper P-4531; Gene Porter, et. Al. December 2009

Case Studies

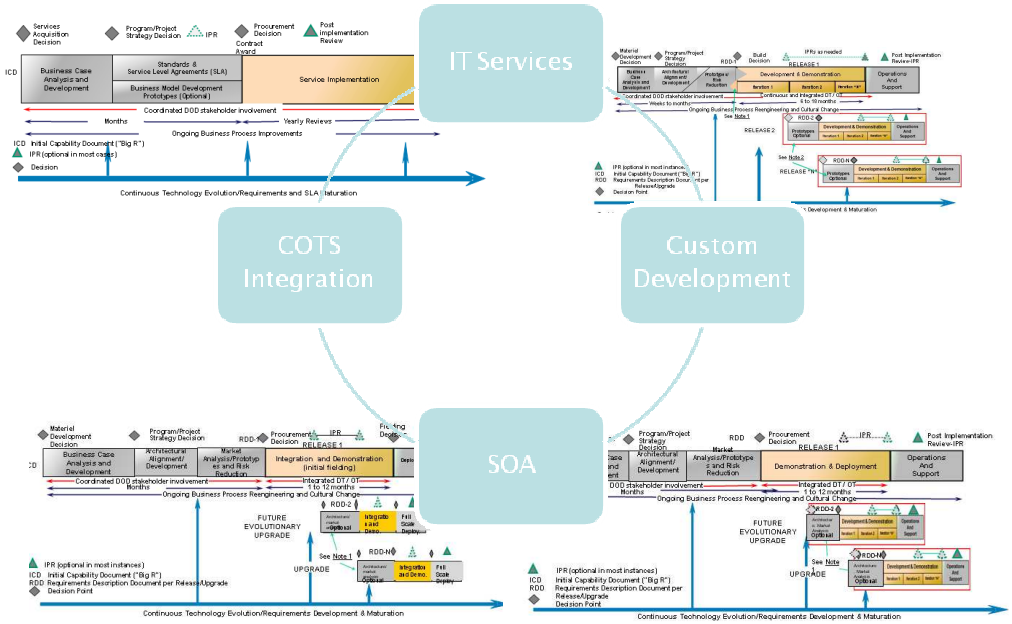
- Acquisition cycle time for major systems using Agile Methods (per Agency Acquisition Executive)
  - Average time from initial milestone to first delivery of capability: 9 months
  - Average time from initial milestone to Initial Operational Capability: 23 months
  - Used on major systems acquisitions to include program with 100+ subcontractors
- ARCI
  - Successful in modernizing embedded IT in submarine fleet at rapid tempo
- DCGS Family of Systems
  - Successful SOA governance augmented with Industry Advisory Group to develop alternative business models and best practices
- GCSS-J & GCSS-AF
  - Evolved to successful SOA implementations

Industry Input

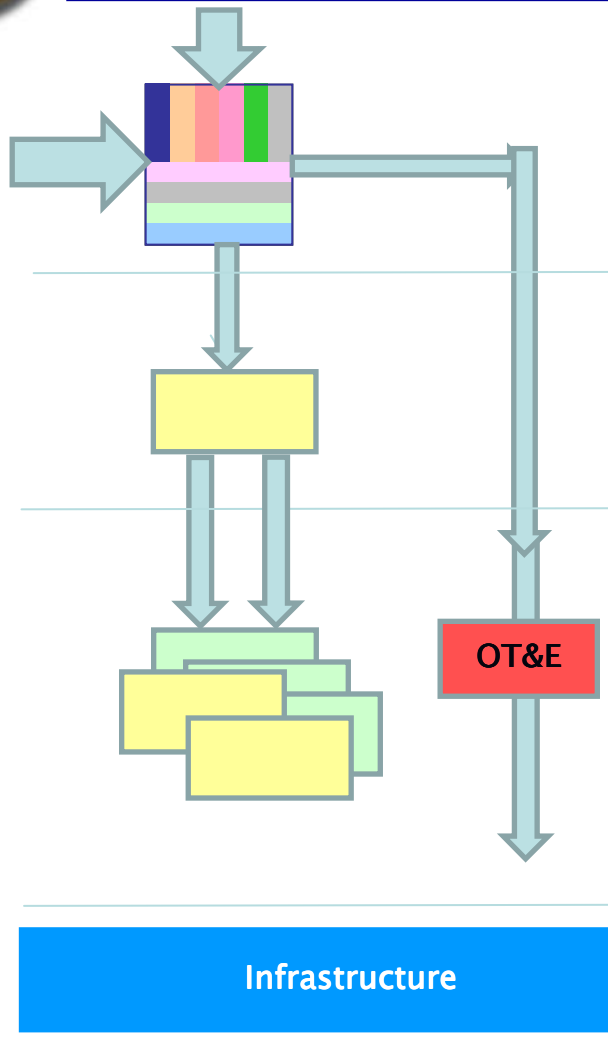
- AFEI/NDIA
  - Leverage defense industry's collective insight into best practices needed to acquire future IT capabilities within DoD. Published white paper on In*dustry Best Practices in the Acquisition of Service Oriented Architectures*
  - Partnership to identify barriers/industry's challenges in implementation of the new IT acquisition process outlined by Section 804
- ASI
  - Study to build-out the acquisition model offered in the March 2009 DSB report on Policies and Procedures in the Acquisition of Information Technology. Final Report outlined 4 templates for spectrum of IT acquisitions within DoD
- CSIS
  - Study to build upon previous work titled "*Developing Tomorrow's Defense and Net-Centric Systems, Organizing for A Complex World*," to investigate policy options to better acquire enterprise capability
- TechAmerica
  - Prepared report for the HASC correlating our findings

What We Have Learned

- New IT Acquisition Model significantly changes how DoD defines requirements, budgets and development of capability
- Acquisition model outlined in March 2009 DSB Report could apply to the full spectrum of IT (NSS & Business) PROVIDED it can be tailored
  - Embedded IT in major weapon systems (i.e., MDAPs) could leverage this process -- additional study is required to determine if DSB model should be applied



Redefining Processes & Incentives



Governance:
- PPBE – Level funding
- Requirements – Dynamic throughout
- Oversight – Continuous

Program Manager:
- Contracts – Modular; early/smaller deliverable
- Prototyping – Continuous throughout
- Transparency – Real-time visibility/data driven

Functional Processes:
- Test – Integrated DT/OT/IA/Interop testing
- System Engineering – Enterprise, TDD, MDD..
- Cost Estimating – Annual/periodic updates
- Logistics/Training – Support iterative delivery
- Technical Maturity – COTS; not driven by DoD

Infrastructure:
- Leverage enterprise capability

Tailoring for risk management vice risk minimization

Considerations for tailoring

- Program definition
  - Platform vs Services
  - Leverage vs replace legacy
  - Beginning and end unclear
- Documentation
  - Cottage Industry with little value
- S&T
  - Separate from Acquisition
- Systems Engineering
  - continuous
- Test
  - Combined and continuous
- Budget
  - Level funding
  - Annual spend based on multi-year roadmap
  - Combine legacy with improvements

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Summary

- The imperative
  - Digital Natives – Understand it can be done
  - Speed of war – Demands we do it
  - Speed of Competition – Provides the means
  - Speed of "Process" – impediment

- Evidence supports potential for real change

- Viable templates emerging
  - Much work yet to be accomplished

We Need to Improve the Process "Impedance Mismatch" to Support Our Digital Native Customers